PRELIMINARY DRAFT
Ambient Air Quality Impact Report / Technical Support Document (TSD)
Honeywell Engines, Systems and Services
Significant Permit Revision #S06-010
November 28, 2006

1. APPLICANT

Honeywell Engines, Systems and Services
111 South 34th Street
Phoenix, AZ 85034

2. PROJECT LOCATION

The Honeywell facility is located at 111 South 34th Street, Phoenix, AZ, which lies within Maricopa County.

With respect to the National Ambient Air Quality Standards (NAAQS), this location is designated as moderate nonattainment for ozone and serious nonattainment for PM_{10}. The project site is under the jurisdiction of the Maricopa County Air Quality Department (MCAQD).

3. PROJECT/PROCESS DESCRIPTION

Honeywell Engines, Systems and Services (Honeywell) filed an application for a significant permit revision for the following pieces of equipment:

Building 422

- Replacement of the nitriding furnace ammonia scrubber
- Installation of a new scrubber for the batch wastewater treatment tank
- Addition of the in-ground vaulted methanol tank to the equipment list

Building 105

- Replacement of the East and West scrubbers
- Replacement of two Rotoclone dust collectors with a cartridge dust collector

3.1 Nitriding Furnace Ammonia Scrubber (92415026)

The nitriding process permit revision consists of replacing an existing packed-bed ammonia scrubber with a similar scrubber. The original scrubber is a model F/WR-1/4 rated at 150 cubic feet per minute (cfm). The replacement scrubber is a Harrington model ECH 1 2-5 lb horizontal wet packed-bed scrubber rated at 750 cfm.

3.2 Batch Wastewater Treatment Tank Scrubber (92415025)

The batch wastewater treatment tank scrubber permit revision consists of installing a packed-bed scrubber to control chlorine and hydrogen sulfide emissions that are generated as a result of batch-treating wastewater in a 3,000-gallon tank. The batch wastewater treatment tank treats smaller volumes of specific types of waste streams that cannot be handled by the facility flow through system, for example, wastewater that has become commingled and cannot be treated easily in the flow-through system and electroless nickel wastewater. The wastewater is treated in a batch process, and the characteristics of the waste may vary from batch to batch. Honeywell primarily treats wastewater from four processes in the batch wastewater tank, which contain three types of waste streams - cyanide, metal-bearing, and electroless nickel.

Cyanide-Bearing Wastewater – Cyanide-bearing wastewater is adjusted to a pH between 10.8 and 11.2, and a stoichiometric amount (ideally) of sodium hypochlorite (NaOCl) is added. The contents of the tank are then mixed until the oxidation-reduction potential (ORP) reaches approximately 500 mV and an excess of chlorine is detected. (Honeywell monitors the wastewater for free chlorine by a wet chemical test.) The pH is then lowered to a range from 7.5 to 9.0 and again NaOCl is added in the same stoichiometric volume until the ORP electrode indicates 800mV and again an excess of chlorine is detected. Some chlorine off-gassing occurs during these treatment steps in the range of 0 to 15 ppm by volume. (Honeywell has measured the chlorine concentration above the tank and the maximum measured amount is 15 ppm).

Metal-Bearing Wastewater - Metal-bearing wastewater with chromium, cadmium or lead is adjusted to a pH of approximately 5. Sludge from the clarifier of the flow-through wastewater treatment system (pH of approximately 9) is added to treat any hexavalent chromium in the batch according to testing performed prior to each batch treatment. The tank is then mixed for at least 2 hours. Samples are taken and tested for discharge parameters prior to completion of each batch treatment. During the phase when the sludge from the clarifier is added to the wastewater in the batch tank, the sludge will emit up to 5 ppm by volume of hydrogen sulfide. (Honeywell has measured the hydrogen sulfide concentration above the tank and the maximum measured amount is 5 ppm).

Electroless Nickel Wastewater - Electroless nickel wastewater is adjusted to a pH of about 6.5. A chemical precipitating product called ChemPrep M-1120, which is a carbamate material, is then added. The nickel metal exchanges anions with the additive and precipitates out. No emissions occur during this process.

3.3 Methanol Tank

The methanol tank is a 6,000-gallon capacity, fixed-roof tank located in an in-ground concrete vault. The tank is vented to the atmosphere and is blanketed with nitrogen. The methanol in the tank is pumped to furnaces used to carburize turbine engine parts. The methanol disassociates inside the furnace and drives carbon into the surface of the part. Emissions from the furnaces have been characterized in the original Title V permit application. This significant permit revision characterizes the emissions and requirements associated with the methanol tank and associated piping only.

3.4 Building 105 East Scrubber (92415028) and West Scrubber (92415027)

The Building 105 scrubber permit revision consists of replacing two existing packed-bed scrubbers (East and West) with similar scrubbers. The existing East scrubber is a Harrington model ECH 89 rated at 34,000 cfm (92415008), which will be replaced with the same model scrubber rated at the same flowrate (92415028). The existing West scrubber is a Harrington model ECH 910 rated at 42,000 cfm (92415009), which will be replaced with a Harrington model ECH 89 rated at 34,000 cfm (92415027).

The scrubbers on the east and west side of Building 105 control emissions from anodizing, etching, machining/inspecting, cleaning, and stripping processes. The East scrubber controls chromium, hydrofluoric, hydrochloric, and nitric acid gas and magnesium and particulate matter (PM) emissions. The West scrubber controls chromium and hydrofluoric acid gas, PM, nickel, and glycol ether emissions.

3.5 Shot Peening Cartridge Dust Collector (92401739)

The shot peening cartridge dust collector permit revision consists of replacing two Rotoclones (92401499 and 92401066) with a MAC Equipment model number 2M2F8 cartridge dust collector (92401739). The cartridge dust collector controls PM emissions from the shot peening process. During the shot peening process, parts are loaded on a fixture and placed inside the machine on a rotating spindle. A stream of shot is then directed at the part surface at high velocity under controlled conditions. This process induces compressive stresses in the exposed surface layers of metallic parts thus increasing part life. The objective is not to remove any material from the surface of the part. Emissions are generated from the breakage of the steel shot. Honeywell uses only hardened cast steel for all shot peening applications. The steel shot is loaded from 50 pound bags into the shot peen feed hopper.

4. EMISSIONS FROM PROJECT

The emissions from each piece of equipment were calculated using AP-42 emission factors, previous material usage, and/or assumptions from facility process engineers. A summary of the emissions for the equipment covered in this permit revision is included in Table 4.1.

Table 4-1
Summary of Annual Emissions (tons/year)

Compound	Ammonia Scrubber	Batch Scrubber	Methanol Tank	East Scrubber	West Scrubber	Dust Collector
PM / PM_{10}	- - -	- - -	- - -	5.50E-04	5.49E-03	0.69
Ammonia	0.14	- - -	- - -	- - -	- - -	- - -
Chlorine	- - -	1.02	- - -	- - -	- - -	- - -
Hydrogen Sulfide	- - -	0.10	- - -	- - -	- - -	- - -
Methanol	- - -	- - -	0.11	- - -	- - -	- - -
Hydrofluoric Acid	- - -	- - -	- - -	1.91E-03	1.07E-03	- - -
Chromium	- - -	- - -	- - -	4.68E-04	5.40E-03	- - -
Hydrochloric Acid	- - -	- - -	- - -	1.72E-03	- - -	- - -
Manganese	- - -	- - -	- - -	8.22E-05	- - -	- - -
Nickel	- - -	- - -	- - -	- - -	9.13E-05	- - -
Glycol Ethers	- - -	- - -	- - -	- - -	5.48E-05	- - -
Total HAPs[1]	**0.14**	**1.12**	**0.11**	**4.18E-03**	**6.62E-03**	**- - -**

PM/PM_{10} = Particulate matter and particulate matter <10µm
HAPs = Hazardous Air Pollutants
1 = Total HAPs includes federal HAPs hydrochloric acid, hydrofluoric acid, manganese, chromium, chlorine, nickel, glycol ethers and methanol (ammonia and Hydrogen Sulfide are AAAQG HAPs)

4.1 Nitriding Furnace Ammonia Scrubber

Ammonia is used in three locations at the facility: the two nitriding furnaces, the copper strip tank, and the used copper strip solution tank. This significant permit revision applies only to the nitriding furnace process. There are two nitriding furnaces and one ammonia scrubber serving both furnaces.

The 1-hour, 24-hour, and annual emissions from the nitriding furnace ammonia scrubber are summarized in Table 4-2.

TABLE 4-2
Emissions from Ammonia Scrubber

Compound	1-Hour (lbs/hr)	24-Hour (lbs/24hr)	Annual(tons/yr)
Ammonia	0.041	0.98	0.14

Annual Emission Rate

The annual emission rate of ammonia from the ammonia scrubber is based on ammonia usage data provided by Honeywell. According to the data supplied by Honeywell in their permit revision application, 90% of the ammonia used at the facility is used in the nitriding process (the other 10% is used in the copper strip tank and the used copper strip solution tank). Of the ammonia used in the nitriding furnaces, 80% is dissociated intro nitrogen and hydrogen prior to entering the furnaces and 20% of the ammonia is fed directly into the nitriding furnaces. Of the ammonia entering the furnaces, 50% reacts with the part and the other 50% remains unreacted and is vented to the scrubber. The scrubber has an ammonia removal efficiency of 99%. The density of ammonia is approximately 20.78 lb/ft^3 at the temperature (1750 degrees Fahrenheit) and pressure (5 to 7 pounds per square inch) it is supplied from the ammonia tank to the nitriding furnaces.

The maximum ammonia emission rate is based on the facility ammonia usage from 2005 (92,724 pounds) scaled to a full year of 8,760 hours. In 2005, the annual ammonia usage data showed that of the 92,724 pounds of ammonia used at the facility, 90% or 83,452 pounds were used in the nitriding furnaces. The two nitriding furnaces operated for a total of 5,400 hours in calendar year 2005. This equates to 15.45 pounds ammonia per hour of furnace operation. The 15.45 pounds per hour was scaled up to a total of 8,760 hours per year operation per furnace, so the maximum ammonia usage in the nitriding process will be 270,684 pounds per year (15.45 lb/hr x 8760 hr/yr x 2 furnaces = 270,684 lb/yr). Since 90% of the total facility ammonia usage is at the nitriding furnaces, the total facility-wide ammonia usage will be limited to 300,760 pounds per year (270,684 x 1/0.90 = 300,760).

The annual emission rate of ammonia from the ammonia scrubber was calculated based on the following equations:

$$UR_{05} = \frac{MU_{05} \times PU}{HO_{05}}$$

$$UR_{05} = \frac{92,724 \times 0.90}{5,400} = 15.45\ lb/hr$$

where: UR_{05} = Ammonia used per hour of furnace operation (lb/furnace-hr)
MU_{05} = Facility ammonia usage in 2005 (92,724 lbs)
PU = Percent of ammonia used in nitriding process (90%)
HO_{05} = Combined hours of operation for nitriding furnaces in 2005 (5,400 hr)

$$ER_{YR} = UR_{05} \times HO_{YR} \times N_F \times A_F \times A_{UR} \times (1 - RE_{AS})$$

$$ER_{YR} = 15.45 \times 8,760 \times 2 \times 0.20 \times 0.50 \times (1 - 0.99) = 271\ lb/yr$$

where: ER_{YR} = Annual ammonia emissions from ammonia scrubber (lb/yr)
HO_{YR} = Annual hours of operation per nitriding furnace (8760 hrs)
N_F = Number of nitriding furnaces (2)
A_F = Percentage of total ammonia sent directly to the nitriding furnace (20%)
A_{UR} = Percentage of un-reacted ammonia vented out of the furnace (50%)
RE_{AS} = Removal efficiency of ammonia scrubber (99%)

Based on the above equations, **271 pounds** of ammonia are emitted from the ammonia scrubber on an annual basis.

1-Hour Emission Rate

The nitriding process consists of supplying 85% ammonia at 100 ft^3/hr for 4 hours and 20% ammonia at 100 ft^3/hr for 30 hours to one furnace. The maximum hourly ammonia emissions were based on the maximum supply of ammonia (100 ft^3/hr), the density at which the ammonia is supplied (0.0481 lb/ft^3), the maximum concentration of the ammonia supplied (85%), the percentage of ammonia that does not react with the part surface (50%), and the efficiency of the ammonia scrubber (99%). The maximum hourly ammonia emissions were based on the following equation:

$$ER_{1HR} = Q \times \rho \times C_{max} \times A_{UR} \times N_F \times (1 - RE_{AS})$$

$$ER_{1HR} = 100 \times 0.0481 \times 0.85 \times 0.50 \times 2 \times (1 - 0.99) = 0.041\ lb/hr$$

Where:
- ER_{1HR} = Ammonia 1-Hour emission rate (lb/hr)
- Q = Ammonia supply flowrate (100 ft^3/hr)
- ρ = Density of supplied ammonia (0.0481 lb/ft^3)
- C_{max} = Maximum concentration of supplied ammonia (85%)
- A_{UR} = Percentage of un-reacted ammonia vented out of the furnace (50%)
- N_F = Number of nitriding furnaces (2)
- RE_{AS} = Removal efficiency of scrubber (99%)

Based on the above equation, the maximum 1-hour ammonia emission rate is **0.041 pounds per hour**.

24-hour Emission Rate

The 24-hour ammonia emission rate was calculated assuming that both furnaces are operating at the maximum 1-hour rate simultaneously for 24 hours. The 24-hour emission rate is **0.98 pounds per day** (0.041 x 24 = 0.98) for both furnaces combined.

4.2 Batch Waste Water Treatment Tank Scrubber

Due to the unique nature of the batch wastewater treatment tank process, published emission factors could not be used to determine potential emissions to the scrubber. Two gases were assumed to be released from the batch wastewater treatment process – chlorine (Cl_2) and hydrogen sulfide (H_2S). Chlorine gas is emitted as the result of the addition of sodium hypochlorite (NaOCl) to treat cyanide-bearing wastewater. Hydrogen sulfide gas is emitted as the result of the addition of clarifier sludge to treat metal-bearing wastewater. The emission estimates of Cl_2 from the batch wastewater tank were calculated using a maximum concentration of Cl_2 in the air above the tank of 15 parts per million by volume (ppmv). The emission estimates of H_2S from the batch wastewater tank were calculated using a maximum concentration of H_2S in the air above the tank of 5 ppmv. Honeywell provided the CL_2 and H_2S concentrations, which were obtained from direct-reading monitoring equipment that was placed above the batch wastewater treatment tank during the batch treatment of wastewater.

The Cl_2 and H_2S emissions from the batch scrubber were calculated using a scrubber flowrate of 11,000 cfm, an ambient temperature of 25 degrees Celsius (^oC), a standard pressure of 760 millimeters of Mercury (mm Hg), and a manufacturer-guaranteed Cl_2 and H_2S scrubber removal efficiency of 87% and 92%, respectively. To determine worst-case emission levels, both the Cl_2 and H_2S emissions from the wastewater treatment tank were assumed to be generated 8,760 hours per year, even though both compounds cannot be generated simultaneously. The capture efficiency was assumed to be 100 percent.

A summary of the emissions of chlorine and hydrogen sulfide from the batch scrubber is presented in Table 4-3.

TABLE 4-3
Emissions from Batch Scrubber

Compound	1-Hour (lbs/hr)	24-Hour (lbs/24hr)	Annual (tons/yr)
Chlorine	0.23	5.52	1.02
Hydrogen Sulfide	0.023	0.552	0.10

The CL_2 and H_2S emissions from the scrubber were calculated using the following equations:

$$C_{X2} = C_{X1} \times \left(\frac{p}{R \times T} \right) \times MW_X \times \frac{1\ lb}{454\ x10^6\ \mu g}$$

$$C_{X2} = 15 \times \left(\frac{1}{8.2\ x10^{-5} \times 298.15} \right) \times 70.9 \times 0.000454 = 9.58\ x10^{-5}\ lb/m^3$$

$$ER_X = Q \times \frac{1\ m^3}{35.31\ ft^3} \times \frac{60\ min}{1\ hr} \times C_{X2} \times (1 - RE_X)$$

$$ER_X = \frac{11{,}000 \times 60 \times 9.58\ x10^{-5} \times (1 - 0.87)}{35.31} = 0.23\ lb/hr$$

Where: C_{X1} = Maximum concentration of X compound (15 ppmv Cl_2, 5 ppmv H_2S)
C_{X2} = Maximum concentration of X compound (lb/m^3)
X = Compound - hydrogen sulfide or chlorine
p = Standard pressure (1 atm)
R = Universal gas constant (8.2E-5 $atm*m^3/mol*K$)
T = Temperature ($25^oC = 298.15^oK$)
MWx = Molecular weight of X compound (g/mol)
ER_X = Emission rate of X compound (lb/hr)
Q = Flowrate of scrubber (11,000 cfm)
RE_X = Removal efficiency of scrubber for X compound (87% Cl_2, 92% H_2S)

The hourly emissions of each compound generated by the above equation are assumed to be the maximum hourly rate (1-hour), because the maximum anticipated concentrations were used. The 24-hour and annual emissions are based on the 1-hour rate multiplied by 24 and 8,760 hours, respectively.

4.3 Methanol Tank

Honeywell determined that methanol emissions originated from two sources:

1. Fugitive emissions from the methanol storage tank
2. Fugitive emissions from the delivery of methanol to three types of furnaces
    - Caburizing Furnaces
    - Rotary Furnace
    - Box Furnaces

Fugitive losses from the methanol tank were calculated using EPA TANKS 4.0. Fugitive losses from pump seal leaks were calculated using the emission factor in the EPA's *Protocol for Equipment Leak Emission Estimates*, 1995. Based on the information presented in the EPA document, methanol is a light liquid. The emission factor used to estimate losses of light liquids from pump seals (0.0199 kg/hr/pump = 0.0090 lb/hr/pump) was obtained from Table 2.1 - SOCMI Average Emission Factors in the EPA document. A summary of the 1-hour, 24-hour, and annual methanol emissions due to losses from the tank and delivery equipment are summarized in Table 4-4.

TABLE 4-3
Summary of Methanol Emissions

Methanol Emission Source	1-Hour (lbs/hr)	24-Hour (lbs/24hr)	Annual (tons/yr)
Tank	0.016	0.38	0.070
Supply to Furnaces (pump)	0.0090	0.22	0.040

Methanol Storage

Methanol is supplied to three types of furnaces, and each type of furnace has a different methanol usage rate. The annual methanol usage was based on the usage of methanol between May 1 and July 31, 2006 (9,202 gallons), distribution of methanol among the three furnace types (carburizing furnaces – 60%; rotary furnace – 30%; box furnaces – 10%), and the collective hours of operation for each type of furnace (carburizing furnaces – 1992 hours; rotary furnace – 2711 hours; box furnaces – 524 hours).

The 1-hour, 24-hour, and annual methanol emissions from the storage tank were based on the annual usage of methanol, calculated from the following equations:

$$AMU_{F1} = \frac{(PMU \times MUF_{F1})}{PHO_{F1}} \times \frac{8{,}760\ hrs}{1\ yr} \times N_{F1}$$

$$AMU_{F1} = \frac{(9{,}202 \times 0.60)}{1{,}992} \times 8{,}760 \times 2 = 48{,}530.4\ gal.$$

$$AMU_T = \sum AMU_{F1,F2,F3...}$$

$$AMU_T = 48{,}530.4 + 8{,}935.2 + 30{,}835.2 = 88{,}301\ gal.$$

where: AMU_{F1} = Annual methanol usage for furnace type 1 (gal)
AMU_T = Total annual methanol usage for the facility (gal)
PMU = Period methanol usage (9,202 gal)
MUF_{F1} = Percentage of total period methanol usage for furnace type 1 (60%)
PHO_{F1} = Period hours of operation for furnace type 1 (1992 hrs)
N_{F1} = Number of type 1 (carburizing) furnaces (2)

Based on the above equations, the facility's maximum potential for methanol usage is 88,301 gallons. Because the methanol emissions from the tank are based on the annual usage of methanol (and are independent of the type of equipment that uses the methanol), Honeywell accepts a limitation on the annual methanol usage (maximum of 88,301 gal/yr).

In addition to the maximum annual usage of methanol, the following assumptions were made and inputted into the TANKS program:

Assumptions – the TANKS modeling assessment for this application was conducted using conservative parameters (5,100 gallon tank with 88,301 gallons/year throughput), which resulted in higher emissions than with the given parameters (6,000 gallon tank and 88,301 gallons/year throughput). The TANKS assessment with a 6,000-gallon tank and 88,301 gallons/year throughput resulted in emissions of 49.05 pounds per year.

Based on the TANKS program, the annual methanol emissions from the storage tanks are **140.4 pounds per year**. The hourly emission rate is 140.4 lbs divided by 8,760 hours (0.016 lb/hr), and the 24-hour emission rate is 140.4 lbs divided by 365 days (0.38 lb/day)

Methanol Supply to Equipment

Methanol is supplied to each of the three furnace types by a single pump located near the methanol tank. The 1-hour, 24-hour, and annual emissions are based on the emission factor from Table 2.1 in the EPA's *Protocol for Equipment Leak Emission Estimates* (0.0090 lb/hr/pump) and on the period of operation (1-hour, 24-hours, and 8,760 hours). The following equation was used to calculate the methanol emissions from the delivery process:

$$ER_P = EF_P \times HO_P \times N_P$$

$$ER_P = 0.0090 \times 8{,}760 \times 1 = 79.2\ lb/yr$$

where: ER_P = Emissions due to losses from equipment "P" (lb/hr, lb/24-hr, lb/yr)
EF_P = Emission factor for equipment "P" (lb/hr/source)
HO_P = Hours of operation for equipment "P" (1-hour, 24-hr, 8760 hrs)
N_P = Number of equipment "P" (sources)

Based on the above equation, the maximum potential annual emission of methanol due to pump seal losses is **79.2 lbs per year**. The 1-hour emission rate of methanol is equal to the emission factor (0.0090 lb/hr), and the 24-hour emission rate is 0.22 pounds per day.

4.4 Building 105 East and West Scrubbers

The compound mass inlets for each scrubber were quantified in the original Title V permit and were based on process emissions. Therefore, the scrubber mass inlets and removal efficiencies are independent of the flowrate, and the replacement scrubbers will have the same mass inlet. In addition, the scrubber manufacturer has guaranteed 90 percent removal efficiency. Because the emissions from the east and west scrubbers are based on the removal efficiency, Honeywell accepts a permit condition of a minimum scrubber removal efficiency of 90 percent.

The scrubber emissions were calculated from the following equation:

$$ER_C = IML_C \times (1 - RE_S)$$

$$ER_{PM} = 0.00550 \times (1 - 0.90) = 0.000550\ tons/yr$$

where: ER_C = Compound "C" emission rate from East or West scrubber (lb/hr, lb/yr)

IML_C = Scrubber inlet mass loading of compound "C" (lb/hr, lb/yr)
RE_S = Removal efficiency of scrubber (decimal %)

The East and West scrubber mass inlets are presented in Table 4-4, and the East and West scrubber emissions are presented in Table 4-5. The 24-Hour uncontrolled emission rates were based on the 1-Hour rate occurring over 24 hours.

Table 4-4
Building 105 East and West Scrubber Mass Inlets

Compound	Uncontrolled Emissions (Scrubber Mass Inlets)					
	East Scrubber			West Scrubber		
	1-Hour[1] (lbs/hr)	24-Hour (lbs/24hr)	Annual[1] (ton/yr)	1-Hour[1] (lbs/hr)	24-Hour (lbs/24hr)	Annual[1] (ton/yr)
PM / PM_{10}	1.26E-03	3.02E-02	5.50E-03	1.26E-02	3.02E-01	5.49E-02
HF	4.38E-03	1.05E-01	1.91E-02	2.44E-03	5.86E-02	1.07E-02
Chromium	1.07E-03	2.57E-02	4.68E-03	1.23E-02	2.95E-01	5.40E-02
HCl	3.94E-03	9.46E-02	1.72E-02	- - -	- - -	- - -
Manganese	1.87E-04	4.49E-03	8.22E-04	- - -	- - -	- - -
Nickel	- - -	- - -	- - -	2.09E-04	4.90E-03	9.13E-04
Glycol Ethers	- - -	- - -	- - -	1.25E-04	3.00E-03	5.48E-04

- - - = Not Applicable
1 = From original Title V permit

Table 4-5
Building 105 East and West Scrubber Emissions

Compound	Scrubber Emissions						
	East Scrubber			West Scrubber			Total Annual (ton/yr)
	1-Hour (lbs/hr)	24-Hour (lbs/24hr)	Annual (ton/yr)	1-Hour (lbs/hr)	24-Hour (lbs/24hr)	Annual (ton/yr)	
PM / PM_{10}	1.26E-04	3.02E-03	5.50E-04	1.26E-03	3.02E-02	5.49E-03	6.04E-03
HF	4.38E-04	1.05E-02	1.91E-03	2.44E-04	5.86E-03	1.07E-03	2.98E-03
Chromium	1.07E-04	2.57E-03	4.68E-04	1.23E-03	2.95E-02	5.40E-03	5.88E-03
HCl	3.94E-04	9.46E-03	1.72E-03	- - -	- - -	- - -	1.72E-03
Manganese	1.87E-05	4.49E-04	8.22E-05	- - -	- - -	- - -	8.22E-05
Nickel	- - -	- - -	- - -	2.09E-05	4.90E-04	9.13E-05	9.13E-05
Glycol Ethers	- - -	- - -	- - -	1.25E-05	3.00E-04	5.48E-05	5.48E-05
Total HAPs[1]	- - -	- - -	4.18E-03	- - -	- - -	6.62E-03	**0.011**

- - - = Not Applicable; HF = hydrofluoric acid, HCl = hydrochloric acid; HAP = Hazardous Air Pollutant
1 = Total HAPs include HF, Chromium, HCl, Nickel, Manganese and Glycol Ethers

4.5 Shot Peen Dust Collector

Three shot peen blasters are vented to a single dust collector. A summary of the PM/PM_{10} emissions from the cartridge dust collector for the shot peening process is provided in Table 4-6.

TABLE 4-6
Summary of Shot Peen Dust Collector Emissions

Criteria Pollutant	1-Hour (lbs/hr)	24-Hour (lbs/24hr)	Annual (tons/yr)
PM/PM_{10}	0.54	3.8	0.69

The PM/PM_{10} emission calculations from the shot peen dust collector were based on the EPA AP-42 Section 13.2.6 emission factor for enclosed abrasive blasting equipped with a fabric filter (0.69 pounds of PM/PM_{10} generated per pound of abrasive used). The PM/PM_{10} emissions were also based on the shot peen usage rate as measured during source testing conducted between July 18 and July 21, 2006 (765 lbs/hr for all three shot peen blasters combined).

The 1-hour dust collector emissions were based on the following equation:

$$ER_{1HR} = EF_{SP} \times UR_{SP}$$

$$ER_{1HR} = \frac{0.69}{1000} \times 765 = 0.53\ lb/hr$$

Where: ER_{1HR} = 1-Hour PM/PM_{10} emissions from dust collector (lb/hr)
EF_{SP} = AP-42 emission factor for shot peen (0.69 $lb_{PM/PM10}$/1000 $lb_{Abrasive\ used}$)
UR_{SP} = Total usage rate of shot peen (765 lb/hr)

Based on the above equation, the maximum 1-Hour PM/PM_{10} emissions from the dust collector are **0.53 pounds per hour**.

The shot peen process takes approximately 109 minutes (including setup and cleaning), and the actual use of shot peen occurs for approximately 32 minutes (29 percent of the process). Assuming the shot peen process occurred in back-to-back situations for 24 hours, the 24-Hour PM/PM_{10} emissions were calculated using the following equation:

$$ER_{24HR} = ER_{1HR} \times \frac{24\ hr}{1\ day} \times \frac{T_{SP}}{T_T}$$

$$ER_{24HR} = 0.53 \times \frac{24}{1} \times \frac{32}{109} = 3.8\ lb/day$$

Where: ER_{24HR} = 24-hr PM/PM_{10} emissions from dust collector (lb/day)
ER_{1HR} = 1-Hour PM/PM_{10} emissions from dust collector (lb/hr)
T_{SP} = Actual shot peen usage time during shot peen process (32 minutes)
T_T = Total time of shot peen process (109 minutes)

Based on the above equation, the maximum 24-Hour PM/PM_{10} emissions from the dust collector are **3.8 pounds per day**.

Assuming the shot peen process occurred in back-to-back situations for an entire year, the annual PM/PM_{10} emissions were calculated using the following equation:

$$ER_{YR} = ER_{1HR} \times \frac{8{,}760\ hr}{1\ yr} \times \frac{T_{SP}}{T_T}$$

$$ER_{24HR} = 0.53 \times \frac{8{,}760}{1} \times \frac{32}{109} = 1{,}363\ lb/yr = 0.69\ tons/yr$$

Where: ER_{YR} = Annual PM/PM_{10} emissions from dust collector (lb/yr)
ER_{1HR} = 1-Hour PM/PM_{10} emissions from dust collector (lb/hr)
T_{SP} = Actual shot peen usage time during shot peen process (32 minutes)
T_T = Total time of shot peen process (109 minutes)

Based on the above equation, the annual PM/PM_{10} emissions from the cartridge dust collector are **0.69 tons per year**.

5. REGULATORY APPLICABILITY

5.1 Applicable Requirements

The Honeywell Engines, Systems and Services facility is a Title V major stationary source of air emissions, as defined in Maricopa County Air Pollution Control Regulations (MCAPCR) Rule 100, Section 200.60c, because it has the potential to emit (PTE) greater than the Title V major source thresholds for carbon monoxide (CO), Volatile Organic Compounds (VOCs) and oxides of nitrogen (NO_x) of 100 tons per year (tpy).

The proposed project is a significant permit revision to the Title V permit, as the changes involve, among other items, changes in recordkeeping and reporting. The proposed project is not a major modification, as there are no significant increases in emissions associated with the changes.

5.1.1 Federal Regulatory Review

The federal regulatory programs reviewed include the New Source Performance Standards (NSPSs) (40 CFR 60) and the National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR 63). Federal authority for NSPS requirements (delineated in 40 CFR Part 60) has been delegated to Maricopa County; therefore Rule 360 is the effective NSPS regulation. None of the proposed changes are subject to NSPSs.

The NESHAPs contain emissions standards related to HAPs for specific new and existing sources. The associated MCAQD Rule is 370. None of the proposed changes are subject to NESHAPs.

5.1.2 State Regulatory Review

Table 5-1 shows the applicable Maricopa County / State Implementation Plan (SIP) rules and associated compliance:

Table 5-1
Applicable Maricopa County / State Implementation Plan (SIP) Rules

SIP Rule Citation	Description	Discussion
Regulation I	General Provisions	Conditions related to this regulation already included in Title V Permit V97-008.
Regulation II	Permits	Conditions related to this regulation already included in Title V Permit V97-008.
Regulation III Section 030	Visible Emissions	Facility-wide provision included as Title V Permit V97-008 condition 18.
Regulation III Section 031	Emissions of particulate matter	Point source particulate emissions from process industries. Conditions related to this regulation already included in Title V Permit V97-008.
Regulation III Section 311	Particulate Matter from Process Industries	Point source particulate emissions from process industries Conditions related to this regulation already included in Title V Permit V97-008.
Regulation III Section 032	Odors and Gaseous Emissions	Ambient air quality impact assessment and the original Title V permit ensure compliance with this requirement.
Regulation III Section 140	Excess Emissions	Provision included as Title V Permit V97-008 condition 10.
Regulation III Section 100	Emission Statements Required	Provision included as Title V Permit V97-008 condition 16.
Regulation IV	Production of Records, Monitoring, Testing, and Sampling Facilities	Conditions related to this regulation already included in Title V Permit V97-008.
Regulation VI	Violations	Provision included as Title V Permit V97-008 condition 8.
Regulation VII	Ambient Air Quality Standards	Ambient air quality impact assessment and the original Title V permit ensure compliance with this requirement.
Regulation VIII	Validity and Operation	Conditions related to this regulation already included in Title V Permit V97-008.

5.1.3 Maricopa County Regulatory Review

Table 5-2 lists the Maricopa County Rules that are applicable to this project. Most rules are applicable to all of the equipment. Rules referencing PM_{10} emissions and abrasive blasting are applicable only to the dust collector for the Building 105 abrasive blaster. Rules referencing H_2S emissions are applicable only to the installation of the Building 422 batch waste treatment tank wet scrubber. Compliance with the applicable requirements is ensured by the existing Title V permit conditions and through the few additional requirements noted in Section 8 of this document.

Table 5-2
Applicable Maricopa County Rules

Rule	Description
Rule 100 §301	**AIR POLLUTION PROHIBITED:** No person shall discharge from any source whatever into the atmosphere regulated air pollutants which exceed in quantity or concentration that specified and allowed in these rules, the Arizona Administrative Code or ARS, or which cause damage to property, or unreasonably interfere with the comfortable enjoyment of life or property of a substantial part of a community, or obscure visibility, or which in any way degrade the quality of the ambient air below the standards established by the Board of Supervisors or the Director.
Rule 200 §302	**TITLE V PERMIT:** A Title V permit or, in the case of an existing permitted source, a permit revision shall be required for a person to commence construction of, to operate, or to modify any of the following: **302.1** Any major source as defined in Rule 100 of these rules.
Rule 210	**TITLE V PERMIT:** A Title V permit or, in the case of an existing permitted source, a permit revision shall be required for a person to commence construction of, to operate, or to modify any of the following: **302.1** Any major source as defined in Rule 100 of these rules.
Rule 210 §302.1	The Permittee shall operate the ECSs at a parametric range of 1.0 to 6.0 inches of water.
Rule 241 §302	**REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) REQUIRED:** An applicant for a permit or permit revision for a new or modified stationary source which emits or causes an increase in emissions of up to 150 lbs/day or 25 tons/yr of volatile organic compounds, or particulate matter; up to 85 lbs/day or 15 tons/yr of PM10; or up to 550 lbs/day or 100 tons/yr of carbon monoxide shall apply RACT for each pollutant emitted from said new or modified stationary source.
Rule 300 §301	LIMITATIONS - OPACITY/GENERAL: No person shall discharge into the ambient air from any single source of emissions any air contaminant, other than uncombined water, in excess of 20% opacity.
Rule 312 §303	**REQUIREMENTS FOR CONFINED BLASTING:** Dry abrasive blasting in a confined enclosure with a forced air exhaust shall be conducted by implementing either of the following: **a.** Using a certified abrasive, or **b.** Venting to an ECS.
Rule 311 §301.1	**LIMITATIONS - PROCESS INDUSTRIES:** No person shall discharge or cause or allow the discharge of particulate matter emissions into the ambient

	air from any affected operation in excess of the allowable hourly emission rate determined by the following equations: **301.1 Process Weight Rates Less Than or Equal to 60,000 Pounds Per Hour:** Determination of the allowable hourly emission rates (E) for process weight rates up to 60,000 lbs/hr shall be accomplished by use of the equation: E = 3.59 P0.62 (P = less than or equal to 30 tons/hr) where: E = Emissions in pounds per hour, and P = Process weight rate in tons per hour.
Rule 312 §305	**OPACITY LIMITATION:** No owner or operator shall discharge into the atmosphere from any abrasive blasting operation any air contaminant for an observation period or periods aggregating more than three minutes in any sixty minute period an opacity equal to or greater than 20 percent. An indicated excess will be considered to have occurred if any cumulative period of 15-second increments totaling more than three minutes within any sixty-minute period was in excess of the opacity standard.
Rule 312 §304	**REQUIREMENTS FOR ECS AND MONITORING DEVICES:** The following requirements apply to blasting equipment that vents through a required ECS and requires a Maricopa County permit under Rule 200 of these rules. Buildings and/or enclosures are not considered control equipment. Equipment that meets the following two criteria and is operated and maintained in accordance with manufacturer's specifications, is exempt from the requirements of this section: **a.** Is self-contained and the total internal volume of the blast section is 50 cubic feet or less, and **b.** Is vented to an ECS. **304.1 Operation and Maintenance (O&M) Plan Required for Emission Control System (ECS)** **a.** An owner or operator shall provide and maintain, readily available at all times, an O&M Plan for any ECS, other emission processing equipment, and ECS monitoring devices that are used pursuant to this rule or to an air pollution control permit. **b.** The owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this rule. If the O&M plan has not been filed, any owner or operator employing an approved existing ECS on the effective date of this rule shall by December 18, 2003 have an O&M plan filed with the Control Officer. **c.** The owner or operator shall comply with all the identified actions and schedules provided in each O&M Plan. **304.2 Installing And Maintaining ECS Monitoring Devices –** An owner or operator operating an ECS pursuant to this rule shall properly install and maintain in calibration, in good working order and in operation, devices described in the facility's O&M Plan that indicate temperatures, pressures, 312.6 rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly.
Rule 300 Rule 210 §302	The Permittee shall observe for visible emissions weekly from each of the ECS exhaust streams during normal operation.

Rule 312 §301	The Permittee shall not discharge into the atmosphere from any abrasive blasting any air contaminant for a period or periods aggregating more than three minutes in any one-hour period which is a shade or density darker than 20 percent opacity.
Rule 312 §505	**OPACITY OBSERVATIONS:** Opacity shall be determined by observations of visible emissions conducted in accordance with EPA Reference Method 9 and with the following provisions: **505.1** Emissions from unconfined blasting shall be observed at the densest point of the emission from the closest point of discharge, after a major portion of the spent abrasives has fallen out. **505.2** Emissions from unconfined blasting employing multiple nozzles shall be considered a single source unless it can be demonstrated by the owner or operator that each nozzle, evaluated separately, meets the emission standards of this rule. **505.3** Emissions from confined blasting shall be observed at the densest point after the air contaminant leaves the enclosure or associated ECS.
Rule 312 §308	**308.1 Unconfined Blasting:** The owner or operator shall clean up spent abrasive material with a potential to be transported during a wind event and, until removal occurs, shall, at a minimum, meet the provisions of Rule 310 of these rules regarding work practices. **308.2 Confined Blasting**: At the end of the work shift the owner or operator shall clean up spillage, carry-out, and/or trackout of any spent abrasive material with a potential to be transported during a wind event.
Rule 312 §501	**RECORDKEEPING AND REPORTING:** At a minimum, an owner or operator subject to this rule shall keep the following records onsite, that are applicable to all abrasive blasting operations. Additional reporting may be required by an air quality permit: **501.1** If blasting operations occur daily or are a part of a facility's primary work activity, then the following shall be kept as a record: 312.7 **a.** A list of the blasting equipment, **b.** The description of the type of blasting as confined, unconfined, sand, wet, or other, **c.** The locations of the blasting equipment or specify if the equipment is portable, **d.** A description of the ECS associated with the blasting operations, **e.** The days of the week blasting occurs, and **f.** The normal hours of operation. **501.2** If blasting operations occur periodically, then the following shall be kept as a record: **a.** The date the blasting occurs, **b.** The blasting equipment that is operating, **c.** A description of the type of blasting, and **d.** A description of the ECS associated with the blasting operations. **501.3** The type and amount of solid abrasive material consumed on a monthly basis. Include name of certified abrasive used, as applicable. **501.4** Material Safety Data Sheets (MSDS) or results of any lead testing that was performed on paint that is to be removed via unconfined blasting, as applicable.

Rule 320 §304	LIMITATION - HYDROGEN SULFIDE: No person shall emit hydrogen sulfide from any location in such a manner or amount that the concentration of such emissions into the ambient air at any occupied place beyond the premises on which the source is located exceeds 0.03 parts per million by volume for any averaging period of 30 minutes or more.
Rule 510 §302.5	The maximum allowable concentration of any air pollutant in any area to which subsection 302.1 of this rule applies shall not exceed a concentration for each pollutant equal to the concentration permitted under the Maricopa County Ambient Air Quality Standards contained in Rule 510 of these rules.

5.2 Non-Applicable Requirements

5.2.1 Federal Non-Applicable Requirements

As discussed previously, none of the proposed changes are subject to NSPS or NESHAP requirements. The Honeywell facility is not a major Federal HAPs source. The total HAPs emissions are less than 25 tons per year (14.82 tons per year), and individual HAPs are less than 10 tons per year. Therefore case-by-case MACT does not apply to the proposed changes.

5.2.2 State Hazardous Air Pollutant Program

The State of Arizona has adopted a State HAPs program under A.R.S. Section 429.06. The applicability thresholds for the State HAPs program are 2.5 TPY or more of any combination of HAPs or 1.0 TPY or more of a single HAP. Maricopa County is required to adopt and implement regulations for a Maricopa County HAPs program. However, Maricopa County has not yet adopted or implemented regulations for a County HAPs program, therefore the State/County HAPs program does not apply

In absence of HAPs program, Maricopa County requests that facilities model HAP emissions to show compliance with a set of Arizona Ambient Air Quality Guidelines (AAAQG). As part of the significant permit revision application, an ambient air quality impact assessment for AAAQGs was submitted for the nitriding furnace scrubber replacement (ammonia) and the Building 422 batch waste treatment tank wet scrubber (H_2S and Cl_2). Potential emissions associated with the methanol tank, Building 105 scrubbers, and the shot peen blasting dust collectors were already assessed as part of the original Title V permit application.

6. AMBIENT AIR QUALITY IMPACTS

6.1 Criteria Pollutants

The sources of criteria pollutants covered by the significant permit revisions include VOCs from the methanol tank and PM-10 from shot peening and the Building 105 East and West replacement scrubbers. The east and west scrubbers are replacements of existing control devices with equivalent emission control resulting in no change in the emissions from these sources. Therefore, no additional modeling is required. The methanol tank emissions are very small (less than 220 pounds per year), and would not contribute to a change in ambient ozone concentrations from total VOC emissions at the facility. In addition, source-specific modeling of VOC emissions is not conducted pursuant to the *USEPA Guidelines for Air Quality Modeling*, which states that simulation of ozone formation and transport is a highly complex and resource intensive exercise and is not typically applied to assess the impact of an individual source on regional ozone concentrations. There are no standard USEPA approaches for an individual source ozone modeling analysis. These two facts indicate that ozone modeling for the very small amount of methanol emissions is not necessary.

6.2 AAAQG Pollutants

In accordance with the Maricopa County Air Quality Division (MCAQD) air toxics policy, an air quality impact assessment is required for AAAQG compounds listed in the 1992 Arizona Ambient Air Quality Guidelines (AAAQGs) if emissions from a source exceed 0.25 ton (500 pounds) per year. Table 6-1 lists the AAAQG compounds potentially emitted from the proposed changes (including all sources of ammonia at the facility). In addition to the ammonia source covered by this permit revision (nitriding furnace ammonia scrubber), five other ammonia sources were identified and quantified to determine if an air quality impact assessment for ammonia was required. The breakdown of the six ammonia sources is also shown in Table 6-1.

Table 6-1
Potential AAAQG Compound Emissions

Compound	Pounds/Year	Tons/Year
Ammonia	5,760	2.88
Ammonia scrubber (from nitriding furnaces)	271	0.14
Fugitive from nitriding process	- - -	- - -
Fugitive from ammonia tank (per transfer)	< 3.0E-3[A]	< 1.5E-6[A]
Fugitive from delivery to copper strip process	- - -	- - -
Copper strip tank scrubber 92415020	5,420	2.71
Fugitive from copper strip tank	67.9	0.034
Hydrogen Sulfide	200	0.10
Chlorine	2,015	1.02
Methanol	220	0.11
Hydrofluoric Acid	5.96	2.98E-03
Chromium	11.8	5.88E-03
Hydrochloric Acid	3.44	1.72E-03
Manganese	0.16	8.22E-05
Nickel	0.18	9.13E-05
Glycol Ethers	0.11	5.48E-05
Total HAPs[1]	**2,527**	**1.26**

HAPs = Hazardous Air Pollutants
1 = Total HAPs includes federal HAPs hydrochloric acid, hydrofluoric acid, manganese, chromium, chlorine, nickel, glycol ethers, and methanol
A = Filling the ammonia tank occurs less than once per year

As shown in Table 6-1, two compounds were identified as potentially exceeding the AAAQG assessment threshold of 500 pounds per year: ammonia and chlorine. Therefore, an analysis was conducted to address potential off-site impacts for these two compounds. The analysis was conducted in accordance with guidance and procedures published by MCAQD for Air Toxics/Hazardous Air Pollutant Permitting Procedures, as well as USEPA guidelines for air dispersion modeling.

Table 6-2 shows the 1-Hour and 24-Hour emission rates for the six ammonia sources that were used in the off-site impact analysis.

Table 6-2
Ammonia Emission Source Values Used in Analysis

Potential Sources of Ammonia Emissions	1-Hour (lbs/hr)	24-Hour (lbs/24hr)	Annual (ton/yr)
Ammonia scrubber (from nitriding furnaces)	0.041	0.98	0.14
Fugitive from nitriding process	- - -	- - -	- - -
Fugitive from ammonia tank (per transfer)	0.003	< 0.003[A]	< 1.5E-6[A]
Fugitive from delivery to copper strip process	- - -	- - -	- - -
Copper strip tank scrubber 92415020	1.5	14.4	2.71
Fugitive from copper strip tank	0.0078	0.19	0.034
Total	**1.55**	**15.6**	**2.88**

- - - = Negligible
A = Filling the ammonia tank occurs less than once per year. 24-hr emissions are therefore considered negligible.

The modelling analysis was conducted using the Windows based BEE-LINE Software (BEEST Version 9.41) to employ the EPA approved ISC3 PRIME modelling program (version 04269). The applicant used urban coefficients with one year (1991) of Phoenix Sky Harbor Airport meteorological data provided by ADEQ to model the ambient impacts. In addition to the one-year analysis conducted by the applicant, the most recent five years of pre-processed ISC-ready meteorological data (1994-1998) were also used to evaluate potential ambient air quality impacts.

The PRIME algorithm was used to account for building downwash effects since the scrubber stacks are below Good Engineering Practice (GEP) formula heights with respect to nearby structures. Receptors were established in appropriate grids and included fenceline receptors at 25 meter spacing, a fine grid out to 250 meters from the fenceline with 50 meter spacing, a medium grid out to 500 meters with 100 meter spacing and a coarse grid out to 1,000 meters with 250 meter spacing. Receptors were also included along a roadway that intersects the facility since that area is accessible to the public and therefore considered ambient air for purposes of this assessment. Because the terrain is relatively flat, the ISC model was run in “flat” terrain mode.

Table 6-3 provides the results of the analysis compared to the AAAQG values. The maximum modelled concentrations from the 1991 meteorological data year are shown in parentheses and the maximum from the five-year meteorological data set are shown without parentheses.

Table 6-3
ISC results compared with AAAQG's

AAAQG Compound/Source	1-Hour AAAQG (µg/m³)	Maxaximum 1-Hour Impacts (µg/m³)*	24-Hour AAAQG (µg/m³)	Maximum 24-Hour Impacts (µg/m³)*
Ammonia				
Nitriding Furnaces Ammonia Scrubber	NA	NA	140	2.93 (1.78)
Copper strip tank through scrubber 92415020	NA	NA	140	18.78 (8.64)
Fugitive from copper strip waste tank	NA	NA	140	1.83 (1.04)
All Sources of Ammonia	**NA**	**NA**	**140**	**21.75 (10.42)**
Chlorine				
Batch Waste Tank Treatment Scrubber	69	21.46 (20.76)	23	6.51 (5.60)
All Sources of Chlorine	**69**	**21.46 (20.76)**	**23**	**6.51 (5.60)**
* The maximum impact location of individual sources may differ; therefore the maximum impact for all sources is not necessarily the addition of each individual source maximum concentration shown.				

Table 6-3 shows that the maximum potential ambient impact of the emissions of ammonia and chlorine are below the AAAQG concentrations by a factor of three (3), at a minimum. Based on these results, the assessed off-site impacts are less than concentrations considered to pose a threat to the public.

6.3 Odorous and Gaseous Air Contaminants

The Batch waste treatment tank will emit the odorous compound H_2S. Pursuant to Maricopa County rule 320, *Odors and Gaseous Air Contaminants*, "No person shall emit hydrogen sulfide from any location in such a manner or amount that the concentration of such emissions into the ambient air at any occupied place beyond the premises on which the source is located exceeds 0.03 parts per million by volume for any averaging period of 30 minutes or more". To assess this requirement, the H_2S emission rate of 0.10 tons/yr (0.023 lb/hr) was modeled in the same fashion as described in Section 6.2 above. The results indicate the maximum potential fenceline concentration over a 30-minute duration will be

0.0016 ppm. This was derived using the modeled 1-hour concentration of 2.01 ug/m^3 (equivalent to 0.0014 ppm) and applying a peaking factor of 1.122 (0.0014 x 1.122 = 0.0016). This peaking factor was derived using a variable power-law equation based on a 30-minute peak time period and an atmospheric stability class dependant power law exponent (using stability class 6 or F when the maximum 1-hr concentration occurred). The power-law exponent for stability class F is 1/6 or 0.16667(1), which when applied to the 30-minute averaging period yields a peaking factor of 1.122. Based on this assessment, the source meets the requirements of Rule 320.

7. ADDITIONAL IMPACT ANALYSIS

The significant permit modification is for replacement of existing equipment and will not cause an increase in emissions. Therefore, the proposed permit revisions are not anticipated to affect the impacts with respect to growth, visibility, soils, vegetation, and endangered species for which approval and issuance of the previous Title V permit was based.

8. REGULATORY STREAMLINING

The existing Title V permit contains numerous monitoring, record keeping, and operational requirements that affect the proposed changes that are the subject of this significant permit revision. The requirements in the existing Title V permit are sufficient for the proposed changes; however, there are a few additional requirements that have been added in order to ensure that the emissions upon which the changes were evaluated will not be exceeded. Specifically, for each device, the following was added:

a. Nitriding furnace ammonia scrubber replacement: An annual ammonia usage limit was added to the permit, along with addition of a limit on pH necessary to ensure proper scrubber operation with a 99% removal rate. Requirements for pH monitoring and record keeping and a requirement for scrubber performance testing were also added to the permit. Other parameters in the existing permit (i.e., recirculation flow rate, blowdown rate, and visible emissions) were adjusted for the specific new scrubber.
b. Batch wastewater treatment scrubber: Limits on the operational parameters necessary to ensure proper scrubber operation with 87% and 92% removal rates for chlorine and hydrogen sulfide were added. The scrubber must be operated and the operational limits met only when treating cyanide bearing waste, metal-

(1) Wang, Jei and Kenneth Skipka, Dispersion Modeling of Odorous Sources, Air and Waste Management Association, Annual Conference 1993.

bearing waste, and/or lead anode waste. This is due to the fact that one of the operational parameters is a very high pH, which is difficult to maintain simply due to the presence of carbon dioxide in the air. Requirements for pH monitoring and record keeping and a requirement for scrubber performance testing were also added to the permit. As is the case for the other packed bed scrubbers, limits on other parameters in the existing permit (i.e., recirculation flow rate, blowdown rate, and visible emissions) are also specified.

c. Methanol tank: An annual methanol usage rate limit and record keeping requirement was added to the permit. There is no additional control technology that reduces methanol emissions.
d. Replacement of Building 105 East and West scrubbers: An operational limit on pH necessary to ensure proper scrubber operation with a 90% removal rate was added. Requirements for pH monitoring and record keeping for the west scrubber (92415027) and requirements for the east and west scrubber performance testing were also added to the permit. The pH requirement was added to the permit for the west scrubber and not the east scrubber due to the presence of ammonium hydroxide in the tanks that vent to the west scrubber. Other parameters in the existing permit (i.e., recirculation flow rate, blowdown rate, and visible emissions) were adjusted for the specific new scrubber.
e. Performance testing requirements for the nitriding furnace, batch wastewater treatment, Building 105 East, and Building 105 West scrubbers were based on current MCAQD policy regarding testing of scrubbers with relatively low inlet concentrations of constituents. If the inlet concentration is less than 10 ppmv, then 90% removal is assumed to occur if the outlet concentration is less than 1 ppmv. However, if this is the case, the permittee must re-test annually until the inlet concentrations are greater than 10 ppmv and the 90% is actually demonstrated (rather than assumed). The 1 ppmv threshold is based on practical detection limits in scrubber outlet exhaust.
f. Replacement cartridge dust collector: A device specific limit on maximum differential pressure was added, since the replacement dust collector requires cartridge replacement when the differential pressure reaches 5.0 inches of water rather than 6.0 inches specified for the other dust collectors at the facility. No limit on shot peen usage was established as the emissions were based on shot peen equipment capacity and continuous operation, which cannot occur.

9. CONCLUSION

Based on the information supplied by Honeywell, and on the analyses conducted by the Maricopa County Air Quality Department, MCAQD has concluded that the requested permit changes, specifically replacement of two Bldg 105 packed bed scrubbers, one Bldg 422 ammonia scrubber, and two rotoclones with a single cartridge dust collector in Bldg 105 and addition of a below ground methanol storage tank in Bldg 422 is consistent with Federal, State, and County regulations and rules and will not cause or contribute to a violation of any federal ambient air quality standard, will not cause any AAAQG to be exceeded, and will not cause additional adverse air quality impacts.

Therefore, MCAQD proposes to issue the significant permit revision subject to the proposed permit conditions.